Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Spectroscopic signatures of crystal momentum fractionalization ANDREW ESSIN, IQIM and Department of Physics, California Institute of Technology, MICHAEL HERMELE, Department of Physics, University of Colorado Boulder — In spin liquids with fractional excitations, the low-energy edge $\Omega(q)$ of the two-spinon continuum carries information about the single-spinon physics. This physics is accessible experimentally in inelastic neutron scattering, for example, in the dynamical spin structure factor. We show that some types of quantum-number fractionalization in gapped, Z_2 spin liquids lead to dramatic signatures in $\Omega(q)$. Notably, it may need to repeat within the first Brillouin zone, which is a direct signature of fractional crystal momentum, remarkable in the absence of symmetry-breaking spatial order.

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Date submitted: 15 Nov 2013 Electronic form version 1.4